

CLAIMS

1. Hydraulic braking device (10) for a turbine (2), the said turbine (2) being provided with a turbine shaft (4),

characterized in that it comprises at least one body (12) connected to the said turbine shaft (4),

5 and in that when the said hydraulic braking device (10) is immersed in a fluid medium, rotation of the turbine shaft (4) about its axis (6) causes a movement of the said at least one body (12) with respect to the said fluid medium, this movement generating a resisting torque (T) related to the rotation speed of the turbine shaft (4) through a non-linear relation.

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2. Device (10) according to claim 1, characterized in that the said non-linear relation is a quadratic relation in which the resisting torque (T) is a function of the square of the rotation speed (ω_t) of the turbine shaft (4) with respect to the said fluid medium.

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3. Device (10) according to claim 1 or 2, characterized in that it comprises a braking shaft (14) coupled to the said turbine shaft (4), and in that the said at least one body (12) is connected to the said braking shaft (14).

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4. Device (10) according to claim 3, characterized in that the said coupling between the braking shaft (14) and the turbine shaft (4) is such that an axial rotation of the turbine shaft (4) causes axial rotation of the braking shaft (14).

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5. Device (10) according to either of claims 3 or 4, characterized in that the braking shaft (14) is coaxial with the turbine shaft (4).

6. Device (10) according to any one of claims 3 to 5, characterized in that the braking shaft (14) and the turbine shaft (4) are combined into a single shaft.

7. Device according to any one of claims 3 to 5, characterized in that the
5 braking shaft (14) and the turbine shaft (4) are coupled through a coupling device (50).

8. Device (10) according to claim 7, characterized in that the said coupling device (50) is a gearbox.

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9. Device (10) according to claim 7 or 8, characterized in that the said coupling device (50) is a clutch.

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10. Device (10) according to one of claims 3 to 9, characterized in that the said at least one body (12) is driven in rotation with the braking shaft (14) when the turbine shaft (4) rotates about its axis.

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11. Device (10) according to any one of claims 3 to 10, characterized in that the said at least one body (12) is rigidly connected to the said braking shaft (14) through a connecting means (18, 20).

12. Device (10) according to any one of claims 3 to 11, characterized in that the said at least one body (12) is fixed directly onto the braking shaft (14) through a connecting means composed of at least one anchor zone (18) of the body (12).

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13. Device (10) according to any one of claims 3 to 11, characterized in that the said at least one body is connected to the said braking shaft (14) through a connecting means composed of at least one rigid arm (20).

14. Device (10) according to claim 12 or 13, characterized in that the said connecting means (18, 20) has a streamlined profile.

15. Device (10) according to any one of claims 3 to 14, characterized in that
5 when it comprises more than one body (12), the said bodies (12) are distributed around the periphery of the braking shaft (14), in a regular manner, or in a non-regular manner.

10 16. Device (10) according to any one of claims 3 to 15, characterized in that when it comprises more than one body (12), the said bodies (12) have either all the same axial positions along the braking shaft (14), or different axial positions along the braking shaft (14).

15 17. Device (10) according to claim 1 to 16, characterized in that when it comprises more than one body (12), the said bodies (12) are chosen to be identical or different

20 18. Device (10) according to any one of claims 1 to 17, characterized in that when it comprises more than one body (12), the said bodies (12) all have the same dimensions.

19. Device (10) according to claim 7 or 8, characterized in that the bodies may be profiled bodies or non-profiled bodies.

25 20. Device (10) according to claim 1 to 19, characterized in that it is arranged on the downstream side of the turbine (2) with respect to a flow direction of the fluid medium.

21. Turbine (2), characterized in that it is equipped with a hydraulic braking device (10) according to any one of claims 1 to 20.

22. Turbine (2) according to claim 21, characterized in that the turbine (2) is
5 immersed in a first fluid medium and the braking device (10) is immersed in a second fluid medium.

23. Drilling equipment, characterized in that it comprises at least one turbine (2) equipped with a hydraulic braking device (10), according to claim 21 or 22.